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# (12) United States Patent

# (54) DISPLAY SCREEN FRONT PANEL OF HMD FOR VIEWING BY USERS VIEWING THE HMD PLAYER

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See application file for complete search history.

#### (56) References Cited

#### U.S. PATENT DOCUMENTS

2015/0253573 A1\* 9/2015 Sako ...... G02B 27/0172 345/156

\* cited by examiner

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#### (57) ABSTRACT

Method for providing image of HMD user to a non-HMD user includes, receiving a first image of a user including the user's facial features captured by an external camera when the user is not wearing a head mounted display (HMD). A second image capturing a portion of the facial features of the user when the user is wearing the HMD is received. An image overlay data is generated by mapping contours of facial features captured in the second image with contours of corresponding facial features captured in the first image. The image overlay data is forwarded to the HMD for rendering on a second display screen that is mounted on a front face of the HMD.

### 13 Claims, 11 Drawing Sheets

